Seabasing Technology Programs at NFESC

Presented by:

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Presentation Topics

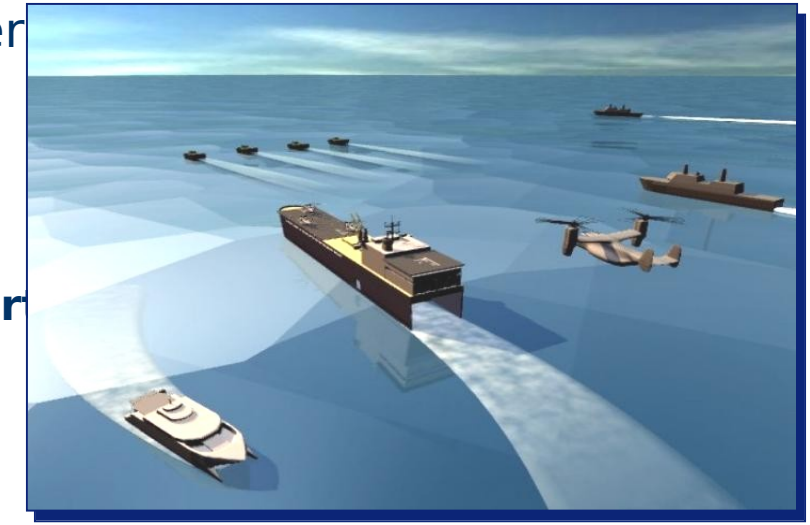
- Introduction
- Seabasing technology programs at Naval Facilities Engineering Service Center (NFESC)
- Automated Logistics (AutoLog) cargo handling system

Seabasing - A National Capability

- **“Seabasing: the concepts and capabilities for exploiting our command of the sea to project, protect, and sustain integrated joint warfighting capabilities. “**

- Naval Transformation Roadmap

- Utilizes sea as maneuver space
- Reduces dependence on fixed & vulner
- Maximizes forward presence
- Supports the Joint fight
  - **Advance Force operations**
  - **SpecOps capabilities & SOF suppor**
  - **Joint sustainment**
  - **Joint C2**
  - **Sea-based aviation**



- Phased at-sea arrival and assembly, selective offload, and projection of a Marine Expeditionary Brigade within 10 – 14 days

Reference: “MPF(F) Status Brief” provided to MARFORPAC Battle Staff by J.S. Smith, NFCB/EFDC/MCCDC, 22 Sep 2004.

Cornerstone Of Naval Transformation

NFESC Technology Programs

Developing Seabasing technology since 1993 …

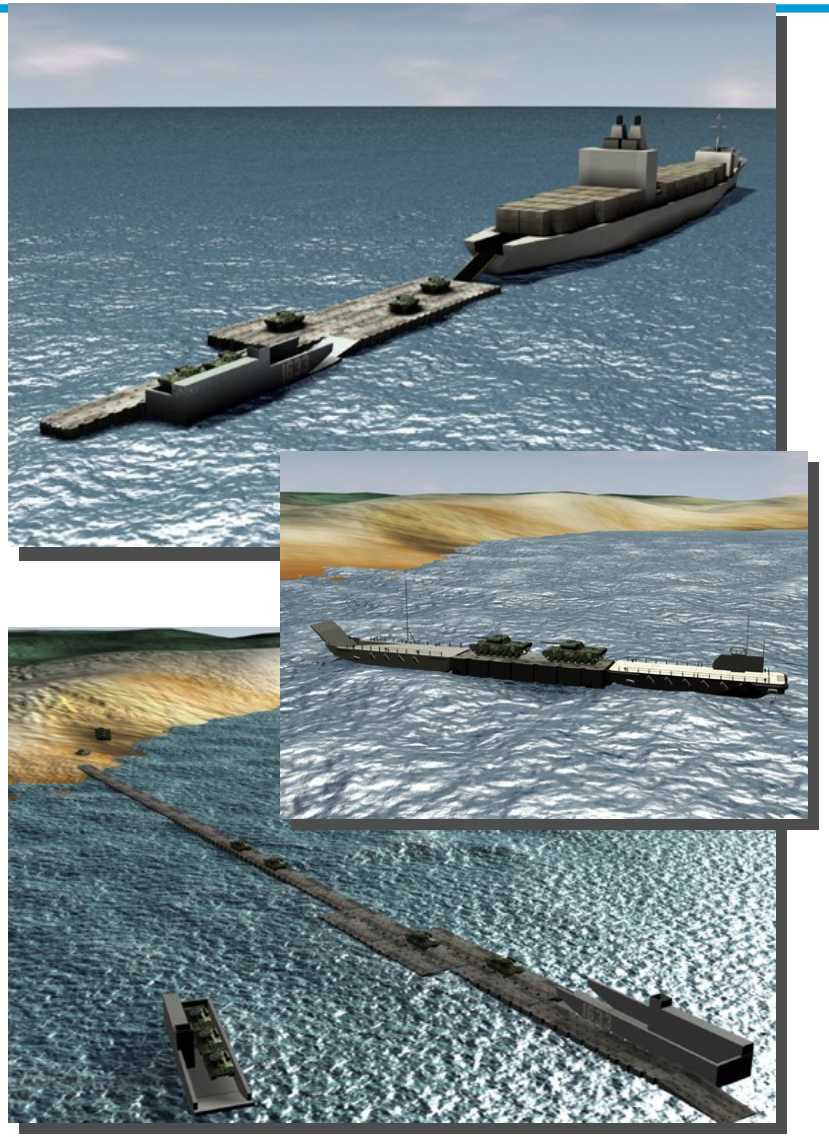
- Improved Navy Lighterage System
- Anti-Terrorism/Force Protection (Waterside Security)
- Seabased Logistics
- Common Logistics Command & Control System
- Self-Propelled Offshore Terminal
- Automated Logistics (Autolog) System

NFESC and Navy Lighterage

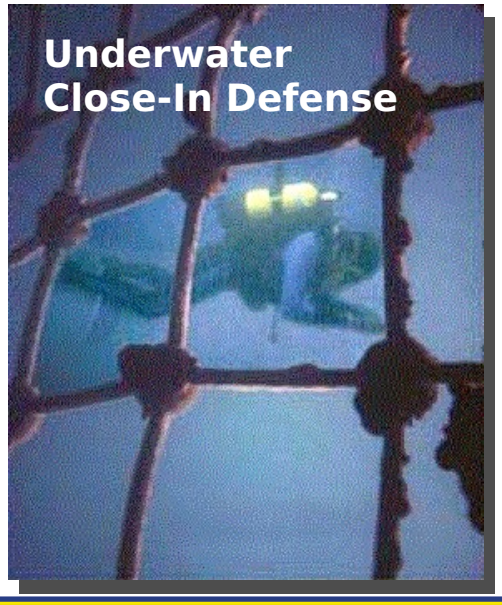
Supporting the Amphibious Construction Battalions since World War II …

Improved Navy Lighterage System

- Support Sealift Support Program Office (SSPO) at NAVFACHQ
- Improved Navy Lighterage System (INLS):
  - Design/test lead for flexor connectors, RRDF Kit, FC Kit, Lighterage Repair Facility
  - Tech Manuals for RRDF and FC
  - INLS System Operations Manual
  - Engineering support for anchoring/mooring systems
  - Member of Engineering IPT
  - Environmental support
- Legacy systems:
  - Fleet support
  - Engineering support
  - Environmental support



Anti-Terrorism/Force Protection (Waterside Security)



Sponsors

- CNO/N775 Security
- Physical Security Equipment Program
- Deep Blue Program Office

Anti-Terrorism/Force Protection (Unmanned Surface Vessels)

- Family of low-cost, quick-transition platforms
- Multiple mission areas including Force Protection, Targeting, and Escort
- Sponsors
  - Office of Naval Research/Tech Solutions
  - Naval Warfare Development Command, Newport
  - Physical Security Equipment Program

ROBOSKI / SWAT

ROBORAIDER

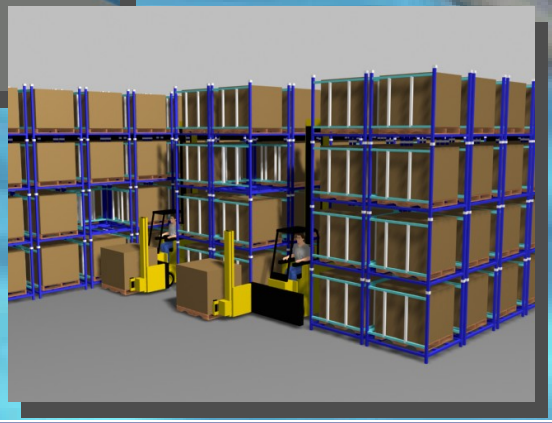
SEAFOX

Integration of Unmanned Assets - Sea Fox and Sea Scan

- Demonstration and test in Seattle area on 12 – 13 January 2005
- Assets:
  - *Sea Scan*, Unmanned Aerial Vehicle (UAV) Provided by Insitu
  - *Sea Fox* – two USVs Provided by NFESC/Industry team
  - Launch and recovery ship, *Shackleton*
  - Chase boat
- Demonstrated:
  - Maritime interdiction operation
  - Visit, board, search, and seizure
  - Escort
  - Swimmer detection

Seabased Logistics – Warehousing and Distribution

- Sponsored by Office of Naval Research
- Warehousing and RFID
- Conveyance systems
- Expeditionary packaging and containerization



Seabased Logistics – Modeling and Simulation

- Tactical Logistics Distribution System (TLoaDS)
  - Assesses current or future sea based distribution systems
  - Discrete event model
  - High speed connectors
- Sea Logistics Distribution System (CLoaDS)
  - Operates within TLoaDS
  - Intra- and inter-ship transfer
- Sponsored by Office of Naval Research

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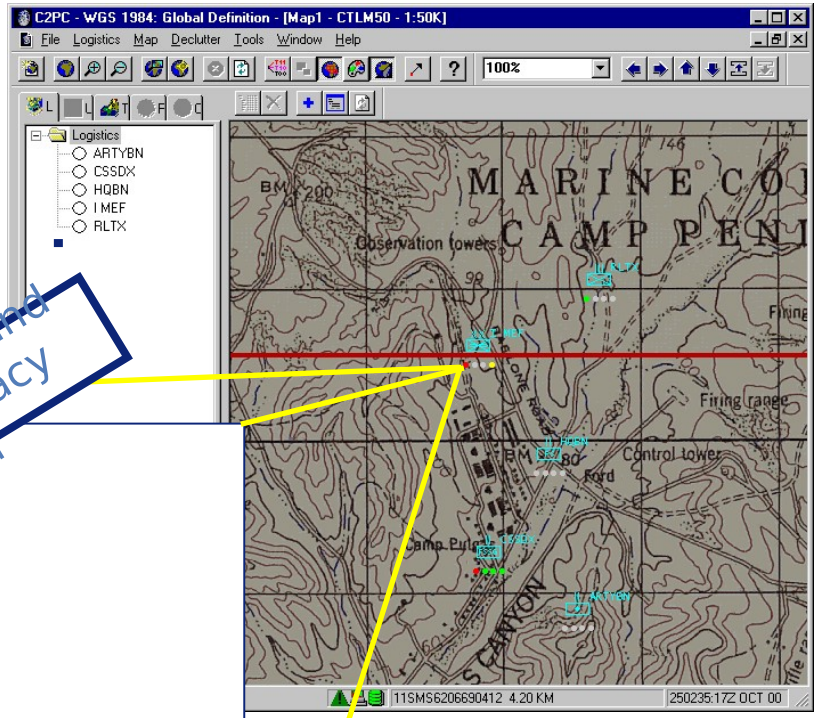
Common Logistics Command and Control System

CLC2S provides Commanders with the capability to perform interoperable tactical logistics Command and Control



NCF/NAVAL and USMC legacy Data

COMMON LOGISTICS COMMAND & CONTROL SYSTEM — CLC2S

ECS — Inventory Management

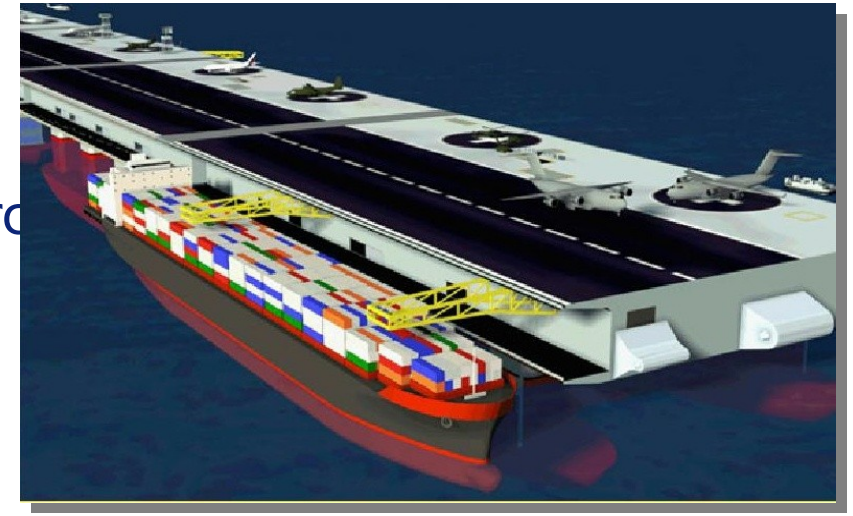
LOGP/E — Logistics Planning and Execution

RRTS — Rapid Request Tracking Systen

ENGP/E — Engineering Planning and Execution

Self-Propelled Offshore Terminal (SPOT) Facility

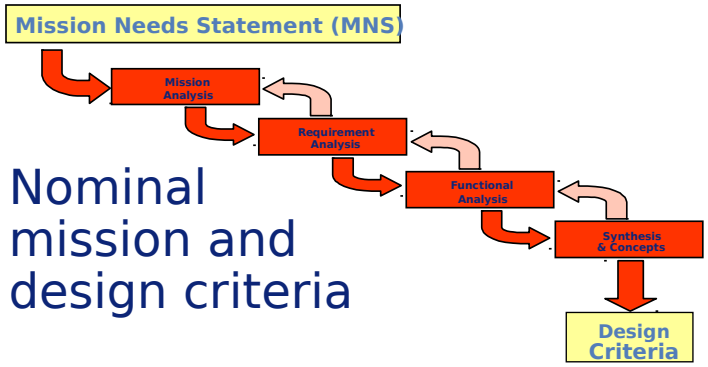
- NFESC “Mobile Offshore Base” Program (follow-on to DARPA)
- Project funded in FY 97 – 00 ($37M)
- Congressionally mandated program
- Sponsored by Office of Naval Researc
- Participants
  - 26 commercial firms
  - 16 universities
  - 11 government organizations



- Objective: Establish feasibility and cost of Sea Base capable of accommodating large cargo aircraft (e.g., C-17)
- Focus on Conventional Take-Off and Landing (CTOL) air operations

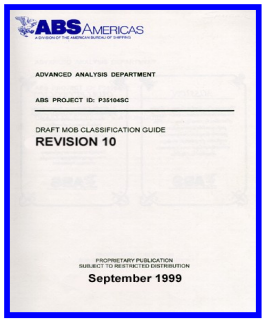
Reference: Mobile Offshore Base (MOB) Science and Technology Program, Final Report, NFESC, Sponsored by ONR, Dec 2000.

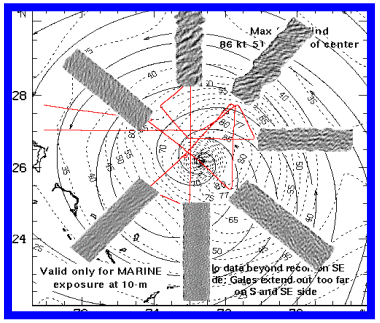
NFESC Development Program

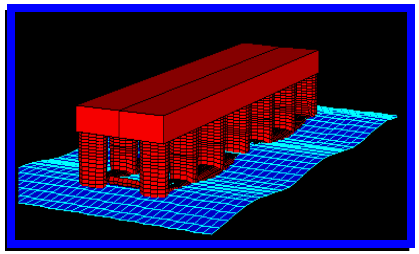


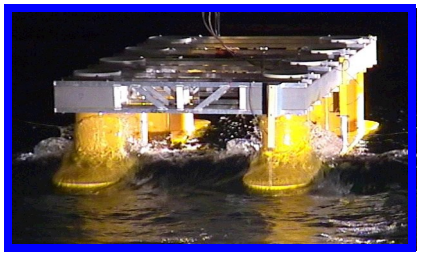
Nominal mission and design criteria

Preliminary design and classification process

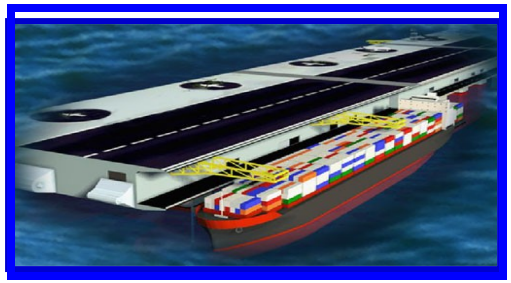



Max wind 86 kt S1 of center
28
26
24
Valid only for MARINE exposure at 10-m
data beyond recommended SE dB. Gales extend out too far on S and SE side

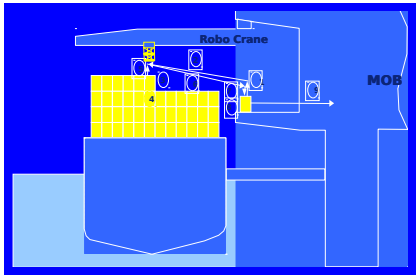




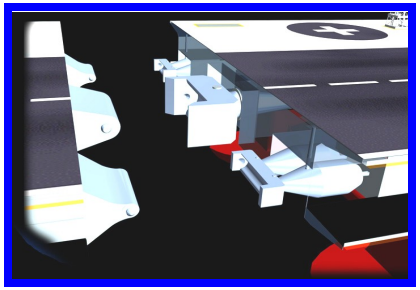
Next generation hydrodynamic models



Four platform preliminary designs



Constructability and Operational performance evaluation tools



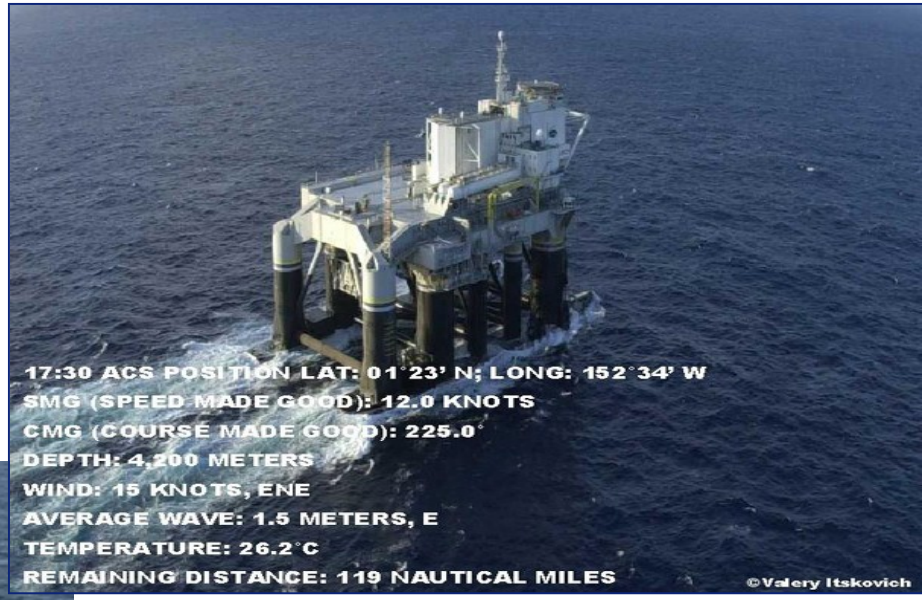
Key components (connectors, dynamic positioning)

Commercial Ventures Similar to SPOT

Commercial semi-submersible platforms

- Mostly petroleum industry
- 400 at average cost $ 400 – 500 M

Reference: Navy League, June 2003.


17:30 ACS POSITION LAT: 01°23' N; LONG: 152°34' W
SMG (SPEED MADE GOOD): 12.0 KNOTS
CMG (COURSE MADE GOOD): 225.0°
DEPTH: 4,200 METERS
WIND: 15 KNOTS, ENE
AVERAGE WAVE: 1.5 METERS, E
TEMPERATURE: 26.2°C
REMAINING DISTANCE: 119 NAUTICAL MILES
©Valery Itskovich

SeaLaunch SM

- Boeing
- RSC Energia
- KB Yuzhnoye
- Kvaerner

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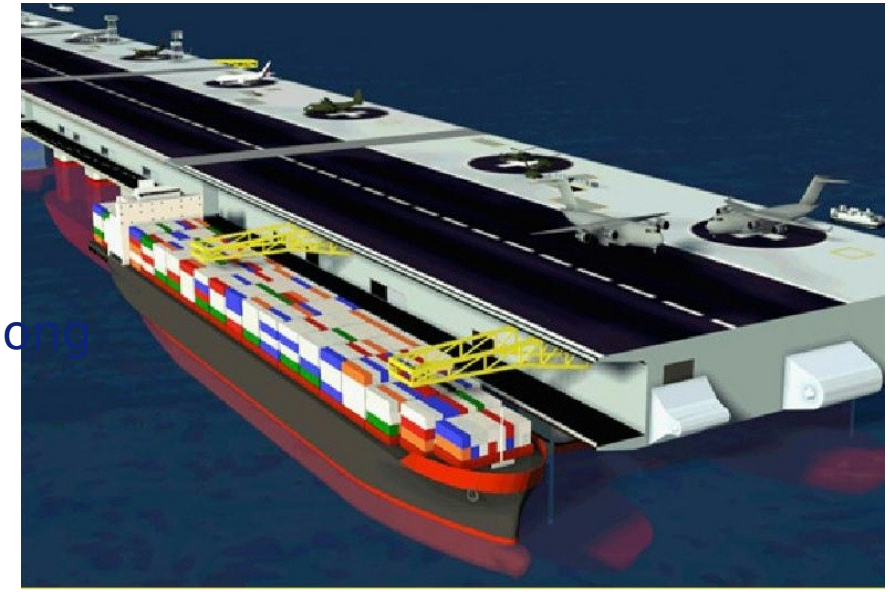
SPOT Facility

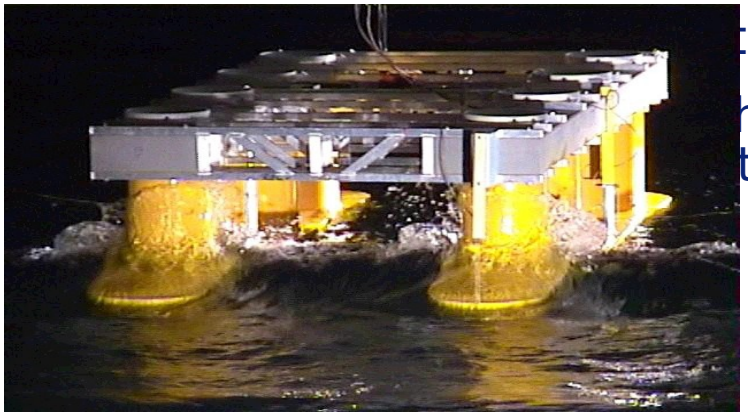
- Can replace or reduce need for Advanced Base (land base) for strategic airlift
- Self-propelled, semi-submersible structure
- Level platform consisting of 1,000-ft long x 400-ft wide modules
- Platform stability independent of sea state
- Modular concept with end connectors

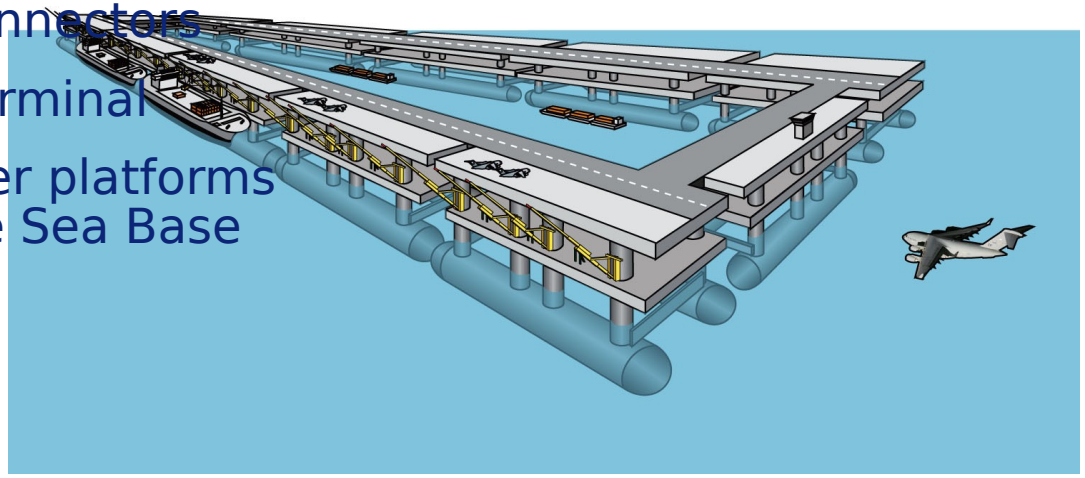
terminal

her platforms

te Sea Base







Automated Logistics (AutoLog) System

- Advanced cargo handling system
- Employs robotics controls
- Positive control of containers and cargo in SS 4 conditions
- Small Business Innovative Research (SBIR) Project
  - SEICOR
  - Pennsylvania State University
- Sponsored by the Office of Naval Research

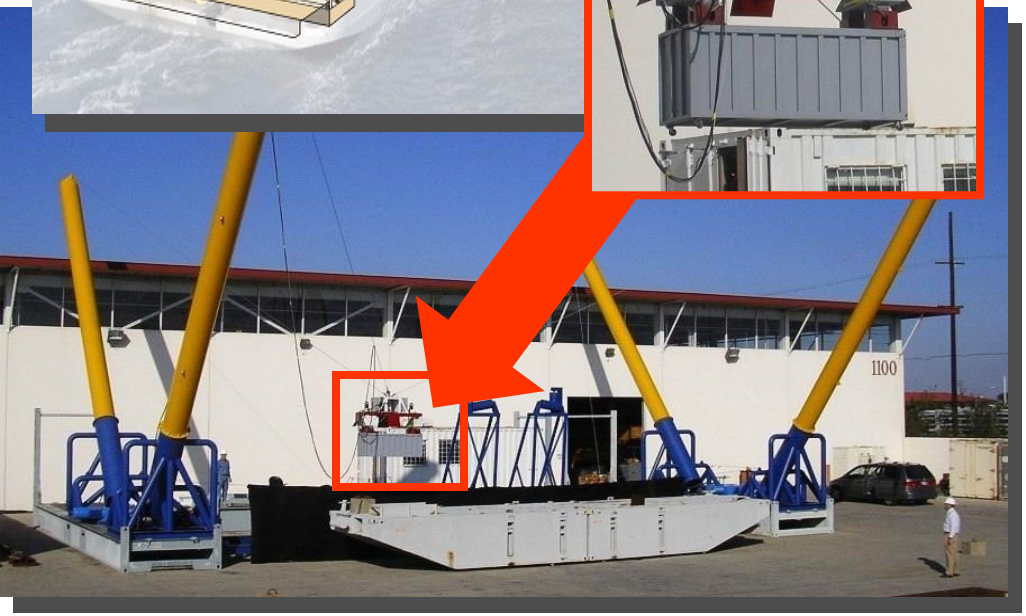
AutoLog – Container Movement and Offload

- Cargo handling in SS-4
- Key enabler for Seabasing
  - MPF/MPF(F) offload
  - Underway replenishment
  - Amphibious operations
- Increased productivity
  - 45 containers/hr (vice 10 containers/hr)
- Reduced manpower
  - >50% reduction
- Reduced operational costs
- Enhanced safety

AutoLog – 1/16-Scale Demonstration

Demonstration in April 2001 at Penn State University

AutoLog – ¼-Scale Prototype



- Land-based testing (December 2004)
- Sea-based testing (March 2005)
- SEICOR SBIR team:

- Penn State/SEICOR – Dr. D. Cannon AutoLog Robotics
- NFESC
  ONR Liaison and SBIR contracting
  System fabrication/integration/testing At-sea testing
- Real Time Innovations
  Software control system Control system testing and integration
- D&K
  Winches
  Motor drive systems

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AutoLog – ¼-Scale Demonstration

Demonstration in December 2004 at NFESC

High Sea State Technologies Test Site

Any Questions?

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